Fig. 16 is a graph of the MR ratio in the structures of Comparative Cases 1 to 4 with the product of Ms×t only in the free layer being reduced.

Fig. 17 is a sectional view of one embodiment of the magnetoresistance effect head of the invention.

Fig. 18 is a schematic view of the magnetic coupling bias field HUA* versus the change in the resistance, R, of the spin valve film depending on the applied magnetic field.

Fig. 19 is a graph of the angle of movement of the magnetization of the pinned magnetic layer, versus time, in the presence of a simulation bias field.

Fig. 20 shows the data of the half-value width of the diffraction peak from the close-packed plane of an antiferromagnetic layer in its rocking curve.

Fig. 21 is a graph of residual magnetization ratio, Mr/Ms, indicating the reduction in the antiferromagnetic coupling capability of the antiferromagnetically coupling layer of Ru after thermal treatment, relative to the thickness of the Ru layer.

Fig. 22A, Fig. 22B and Fig. 22C are graphs of resistance change in spin valve films versus the applied magnetic field.

Fig. 23A, Fig. 23B and Fig. 23C are graphs of resistance change in spin valve films with the thicknesses of the ferromagnetic layer A and ferromagnetic layer B being varied, versus the applied magnetic field.

Fig. 24A and Fig. 24B are graphs of resistance versus output in a spin valve device to which has been applied a simulation ESD voltage by a human body model.

Fig. 25A and Fig. 25B are graphs of resistance versus output in another spin valve device to which has been applied a simulation ESD voltage by a human body model.

Fig. 26 is a perspective view of a spin valve film, indicating the stray magnetic field from the film.

Fig. 27 is a sectional view of another embodiment of the magnetoresistance effect head of the invention.

Fig. 28 is a sectional view of still another embodiment of the magnetoresistance effect head of the invention.

Fig. 29 is a sectional view of still another embodiment of the magnetoresistance effect head of the invention.

Fig. 30 is a sectional view of still another embodiment of the magnetoresistance effect head of the invention.

Fig. 31 is a sectional view of still another embodiment of the magnetoresistance effect head of the invention.

Fig. 32 is a sectional view of the essential structure of one embodiment of the magnetoresistance effect device of the invention.

Fig. 33 is a sectional view of one modification of the embodiment of the magnetoresistance effect device of Fig. 32.

Fig. 34 is a sectional view of another modification of the embodiment of the magnetoresistance effect device of Fig.

32.

Fig. 35A, Fig. 35B and Fig. 35C are views showing the reduction in the MR ratio in conventional spin valve films after thermal treatment.

Fig. 36 is a view explaining specular reflection on metal/metal interface.

Fig. 37A and Fig. 37B are graphs showing two examples of the relationship between the ratio of the Fermi wavelength in a reflective film to the Fermi wavelength in a GMR film adjacent to the reflective film, and the critical angle θc.

Fig. 38 is a graph of the data of the critical angle θc at which Au(Ag)/Cu interface produces specular reflection, as calculated from the Fermi wavelength at the interface.

Fig. 39 is a sectional view of still another modification of the magnetoresistance effect device of Fig. 32.

Fig. 40 is a sectional view of one modification of the magnetoresistance effect device of Fig. 39.

Fig. 41 is a sectional view of the essential part of the second embodiment of the magnetoresistance effect device of the invention.

Fig. 42 is a sectional view of one modification of the magnetoresistance effect device of Fig. 41.

Fig. 43 is a sectional view of the essential part of the third embodiment of the magnetoresistance effect device